

Aero Design Ltd.**Work Order Control Sheet**Work Order#: 2017-04 Date Opened: 05 Jan 2017 Title: FabricationAircraft OEM: Bell Aircraft Model: 212 Product Type: High Beams Product Model: Struts Quantity: 1 set**Work Order Contents**

Work Order/Build Sheets (Procedures Provided)
Additional Work Sheets (Standard Practice)
Drawings (See List Below)
Parts Distribution Sheet
Sub Component Tags
Completed Certification
Time Sheet (R&D)
Notes

Initial or N/A

DB
N/A
DB
DB
N/A
JC
N/A
N/A

Build Sheet Contents

Tasks Initialled
Dual Inspections Initialled

Initial or N/A

JC
JC

Drawing List

Drawing #	Rev #	Description	Initial or N/A
100635	0	Strut Fabrication	DB
100606	0	High Mounted Prov. Inst.	DB

Component Completion

Quantity Complete on This Work Order
Quantity Incomplete on This Work Order
Further Processing Required Before Release
Release to Stock as Components

As Instructed

1 set
N/A
N/A
N/A

Certification

Form One Completed
Serviceable (Green) Tag Completed
In Process (Yellow) Tag Completed
Unserviceable (Red) Tag Completed
Parts Tracking (White) Tags Completed
Parts Placed in Stores for Distribution

Initial or N/A

JC
N/A
N/A
N/A
N/A
N/A

Additional Documentation

Documentation of a minor change
Non-Conformance Report Required
Service Difficulty Report Required

Initial or N/A

N/A
N/A
N/A

Billing

Local (Aero Design)
Research and Development
Third Party

Initial or N/A

JC
N/A
N/A

Traveller

Initial or N/A

Work performed by:

Print: D. BartfaiSign: SCA: AD07Date: 09-Jan-17

ICC / Dual Inspection performed by:

Print: Jeff ClarkeSign: SCA: AD02Date: 09-Jan-17

Work Order closed by:

Print: Jeff ClarkeSign: SCA: AD02Date: 09-Jan-17

Approved Manufacturing Facility 73-04

Form 20.D.03

Rev. Original 23 Sep 2014

1. Approving Civil Aviation Authority/Country Transport Canada		2. AUTHORIZED RELEASE CERTIFICATE FORM ONE			3. Form Tracking No. 2017-0014
4. Organization Name and Address AERO Design Ltd. – 9888A Malaspina Road, Powell River, BC, V8A 0G3					5. Work Order/Contract/Invoice WO 2017-04
6. Item	7. Description	8. Part Number	9. Qty.	10. Serial/Batch No.	11. Status/Work
1.	Forward Strut	100635-01	1	N/A	New
2.	Aft Strut	100635-02	1		
3.	Drag Link	100635-03	1		
12. Remarks					
13a. Certifies that the items identified above were manufactured in conformity to: <input checked="" type="checkbox"/> Approved design data and are in condition for safe operation. <input type="checkbox"/> Non approved design data specified in block 12.			14a. <input type="checkbox"/> CAR 571.10 Maintenance Release <input type="checkbox"/> Other regulation specified in block 12 Certifies that unless otherwise specified in block 12, the work identified in block 11 and described in block 12, has been performed in compliance with the Canadian Aviation Regulations.		
13b. Signature  73-04 02		13c. Approved Organization Number AMF 73-04		14b. Signature	
13d. Name Jeff Clarke - AD02		13e. Date (dd/mm/yyyy) 09 Jan 2017		14c. Approved Organization Number	
				14d. Name	
				14e. Date (dd/mm/yyyy)	
<p align="center">Installer Responsibilities</p> <p>This certificate does not constitute authority to install.</p> <p>Installers working in accordance with the national regulations of a country other than that specified in block 1 must ensure that their regulations recognize certifications from the country specified.</p> <p>Statements in blocks 13a or 14a do not constitute installation certification. In all cases, the technical record for the aircraft must contain an installation certification issued in accordance with the applicable national regulations before the aircraft may be flown.</p>					

EAGLE COPTERS S.A.

STRUT FABRICATION – 100635

General

These instructions apply to Struts 100635-01 and 100635-02 and Drag Link 100635-03 for Bell 205/212/412 cargo baskets. Refer to the following drawings, at the current revision, for dimensions and details:

100630, Revision 0 – Forward Beam Fabrication, Low

Work Order: 2017-04

Complete
(initial or SCA #)

Date Open: 05 JAN 2017

Batch Quantity: 100635-01 Forward Strut: 1
100635-02 Aft Strut: 1
100635-03 Drag Link: 1

100635-01	100635-02	100635-03
AD	AD	AD
73-04	73-04	73-04
<u>07</u>	<u>07</u>	<u>07</u>

1. Fabrication – $\frac{3}{4}$ "x0.065 tubes

- Cut $\frac{3}{4}$ "x0.065 material as indicated on drawings.
 - 100635-01: 100635-04 (tube), 15.55" long
 - 100635-02: 100635-05 (tube), 9.8" long
 - 100635-03: 100635-06 (tube), 22.3" long
- Record material PO on attached material list.
- De-burr cut ends.
- Remove writing on tubes with acetone.
- Tag in-progress parts and place on in-progress shelf in machine shop for turning.

AD	AD	AD
73-04	73-04	73-04
<u>07</u>	<u>07</u>	<u>07</u>

2. Turning

- Load tube in collet in lathe. Ensure tube is not scratched by collet.
- Turn one end flat at 1030 RPM, 0.01 in/rev.
- Deburr ID and OD.
- Flip part, turn end flat and to length specified on drawing at 1030 RPM, 0.01 in/rev.
- Deburr ID and OD.
- Tag completed parts and place on in-progress shelf in welding shop for welding.

3. Welding – 100635-01 Forward Strut

- TIG weld 100635-07 Fitting and 100635-09 Threaded Rod End into 100635-04 Tube using ER308L rod.
- Record component and welding rod POs / WOs on attached material list.
- Tag in-progress parts for straightening.

AD
73-04
05

STRUT FABRICATION – 100635

Complete
(initial or SCA #)

100635-01 100635-02 100635-03

4. Welding – 100635-02 Aft Strut

- a. TIG weld 100635-08 Fitting and 100635-09 Threaded Rod End into 100635-05 Tube using ER308L rod.
- b. Record component and welding rod POs / WOs on attached material list.
- c. Tag in-progress parts for straightening.

AD
73-04
05

5. Welding – 100635-03 Drag Link

- a. TIG weld two 100635-09 Threaded Rod End into tube 100635-06 using ER308L rod.
- b. Record component and welding rod POs / WOs on attached material list.
- c. Tag in-progress parts for straightening.

AD
73-04
02

AD
73-04
02

AD
73-04
02

6. Final Inspection

To be completed by a different person than the previous steps.

- a. Inspect Struts and Drag Link for conformity to drawing.
- b. Tag in-progress parts ready for powder coating.

AD
73-04
07

AD
73-04
07

AD
73-04
07

7. Powder Coating - *Paint*

- a. Parts are to be powder coated in accordance with commercial practices.
- b. Inspect powder coating on receiving.
- c. Tag in-progress parts ready for final assembly.

AD
73-04
07

AD
73-04
07

AD
73-04
07

8. Final Assembly

To be completed after powder coating.

- a. Adhere P/N placard at center of tube.
- b. Ensure AN4/AN5 bolt can be inserted through lugs.
- c. Install AN316-5R Check Nut and AN665-46R Clevis on Threaded Rod Ends. Do not torque check nuts.
- d. Green tag complete beam assembly and place into stock.

ROD END FABRICATION – 100635

General

These instructions apply to Threaded Rod End 100635-09 for mounting Bell 205/212/412 cargo baskets. Refer to the following drawings, at the current revision, for dimensions and details:

100635, Revision 0 – Strut Fabrication

Work Order: 2617-04

Batch Quantity: 6

Complete
(initial or SCA #)

Date Open: 05 JAN 2017

AD
73-04
07

1. Stock Preparation

- Cut 0.75 round stock, over 4" long.
- Cut 5/16-24 threaded rod to 2" long.
- Record material PO on attached material list.
- De-burr cut ends.
- Tag in-progress parts and place on in-progress shelf in machine shop for CNC machining.

AD
73-04
07

2. Turning – 100635-10 Threaded Bushing

- Load part in collet in lathe.
- Face end at 1030 RPM, 0.01 in/rev.
- Turn OD to tight fit inside strut tube (3/4 x 0.065 tube) at 1030 RPM, 0.04 in/rev.
- Deburr.
- Cut or part turned section, min 0.58 long.
- Load part in collet in lathe, on turned section.
- Face end to length at 1030 RPM, 0.01 in/rev.
- Centre drill.
- Tap drill I (0.272) at 300 RPM.
- Tap 5/16-24.
- Deburr.
- Tag in-progress parts and place on in-progress shelf in welding shop for welding.

AD
73-04
07

3. Turning – 100635-11 Threaded Rod

- Load part in collet in lathe.
- Face end at 1030 RPM, 0.01 in/rev.
- Deburr.
- Flip part, face end to length at 1030 RPM, 0.01 in/rev.
- Deburr.
- Tag in-progress parts and place on in-progress shelf in welding shop for welding.

AD
73-04
05

4. Welding

- Thread rod into bushing, flush with inside end.
- TIG weld threaded rod to bushing using ER308L Rod.
- Tag completed parts and place on in-progress shelf in welding shop for further assembly.

Work Order: 2017-04Material Tracking Sheet
Bell 205/212 Mounting Beam Struts

1 of 2

Date Open: 05 JAN 2017

Ass'y Step	Qty	Detail Drawing	Part Number	Description	Material	PO/WO
	<u>1</u>		100635-01	Forward Strut		
	. 1		100635-04	Tube	304 Stainless, 3/4" x 0.065" Rnd. Tube	<u>14103</u>
	. 1		100635-07	Fitting	304 Stainless, 1.0 Round	<u>14103</u>
	. 1		100635-09	Threaded Rod End		below
	A/R		ER308L	Welding Rod		<u>14028</u>
	. 1		AN665-46R	Clevis End		
	. 1		AN315-5R	Check Nut		
	. 1		--	P/N Placard	TZ Tape, 1/2"	commercial
	<u>1</u>		100635-02	Aft Strut		
	. 1		100635-05	Tube	304 Stainless, 3/4" x 0.065" Rnd. Tube	<u>14103</u>
	. 1		100635-08	Fitting	304 Stainless, 1.0 Round	<u>14103</u>
	. 1		100635-09	Threaded Rod End		below
	A/R		ER308L	Welding Rod		<u>14028</u>
	. 1		AN665-46R	Clevis End		
	. 1		AN315-5R	Check Nut		
	. 1		--	P/N Placard	TZ Tape, 1/2"	commercial
	<u>1</u>		100635-03	Drag Link		
	. 1		100635-06	Tube	304 Stainless, 3/4" x 0.065" Rnd. Tube	<u>14103</u>
	. 1		100635-08	Fitting	304 Stainless, 1.0 Round	<u>N/A</u>
	. 2		100635-09	Threaded Rod End		below
	A/R		ER308L	Welding Rod		<u>14028</u>
	. 2		AN665-46R	Clevis End		
	. 2		AN315-5R	Check Nut		
	. 1		--	P/N Placard	TZ Tape, 1/2"	commercial
	<u>46</u> jc.		100635-09	Threaded Rod End	(4 per set)	
	. 1		100635-10	Threaded Bushing	304 Stainless, 3/4" Rod	<u>15073</u>
	. 1		100635-11	Threaded Rod	304 Stainless, 5/16-24 Threaded Rod	<u>16071</u>
	A/R		ER308L	Welding Rod		<u>14028</u>

Work Order: _____

Material Tracking Sheet
Bell 205/212 Mounting Beam Struts

2 of 2

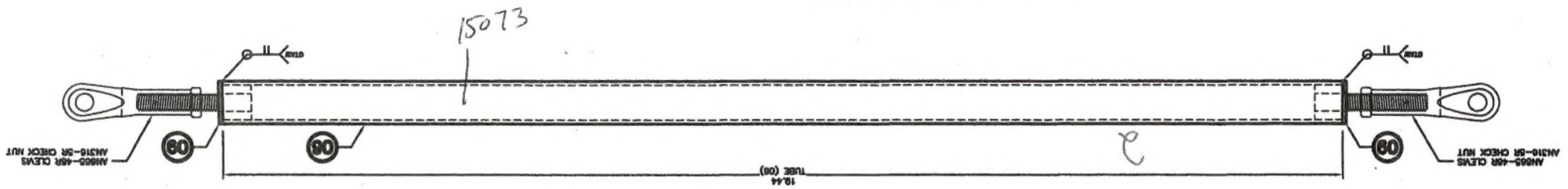
Date Open: _____

Ass'y Step	Qty	Detail Drawing	Part Number	Description	Material	PO/WO
	1		100635-12	Bushing	Brass, 3/8" Rod	13050
	1		100635-13	Bushing	Brass, 5/16" Rod	16043
	N/A		100635-14	Bushing*	304 Stainless, 5/8" Rod	

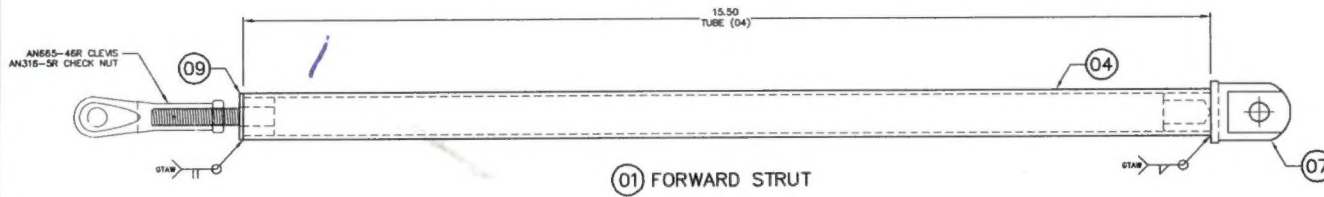
*(only required for long eyebolts)

212

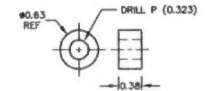
EXTRA LINK - FWD



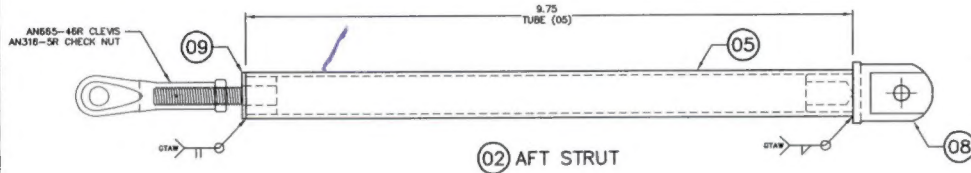
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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



01 FORWARD STRUT



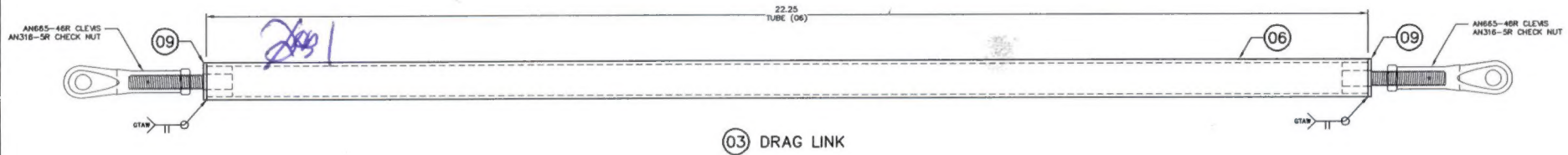
14 BUSHING



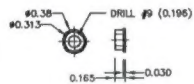
02 AFT STRUT

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. WELDING OF 304 STAINLESS STEEL TO BE COMPLETED BY GTAW METHOD TO AMS2685C. WELDING ROD SHALL CONFORM TO ER308L OR EQUIVALENT.
3. THOROUGHLY DEGREASE, EPOXY PRIME AND POLYURETHANE PAINT ALL PARTS AFTER WELDING. ALTERNATE: THOROUGHLY DEGREASE AND POWDER COAT ALL PARTS AFTER WELDING. DO NOT PAINT/POWDER COAT THREADED RODS. ASSEMBLE HARDWARE AFTER PAINT/POWDER COAT.



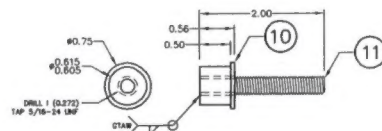
03 DRAG LINK



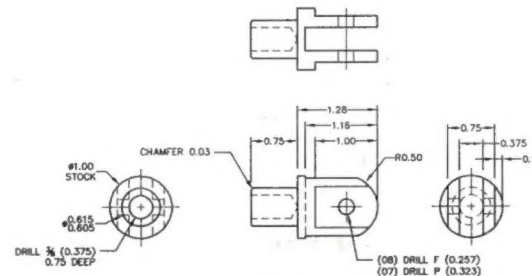
12 BUSHING



13 BUSHING



09 THREADED ROD END



08 FITTING

07 FITTING

07 AND 08 IDENTICAL EXCEPT FOR HOLE AS NOTED

QTY	QTY	QTY	QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
2	1	1		AN315-SR	CHECK NUT				
2	1	1		AN665-46R	CLEVIS ROD END				
				100635-14	14 BUSHING		304 STAINLESS STEEL	ASTM A479	#0.625 ROD
				100635-13	13 BUSHING		BRASS	ASTM B927	#0.313 ROD
				100635-12	12 BUSHING		BRASS	ASTM B927	#0.375 ROD
1				100635-11	11 THREADED ROD		304 STAINLESS STEEL	ASTM F583	5/16-24 THREADED ROD
1				100635-10	10 THREADED BUSHING		304 STAINLESS STEEL	ASTM A479	#0.75 ROD
2	1	1		100635-09	09 THREADED ROD END		304 STAINLESS STEEL	ASTM A479	#1.0 ROD
				100635-08	08 FITTING		304 STAINLESS STEEL	ASTM A479	#1.0 ROD
				100635-07	07 FITTING		304 STAINLESS STEEL	ASTM A479	#1.0 ROD
1				100635-06	06 TUBE		304 STAINLESS STEEL	ASTM A269	#0.75 X 0.065 RND. TUBE
1				100635-05	05 TUBE		304 STAINLESS STEEL	ASTM A269	#0.75 X 0.065 RND. TUBE
1				100635-04	04 TUBE		304 STAINLESS STEEL	ASTM A269	#0.75 X 0.065 RND. TUBE
				100635-03	03 DRAG LINK				
				100635-02	02 AFT STRUT				
				100635-01	01 FORWARD STRUT				
09	03	02	01						
QTY	QTY	QTY	QTY						

APPROVALS	DATE
DRAWN: JEFF CLARKE	18 DEC 2014
CHECKED: JASON KEVIE	18 DEC 2014

AERO DESIGN LTD.
 8088A MALASPINA ROAD
 POWELL RIVER, BC, CANADA, V8A 0G5
 TEL: 250-683-2276 www.aerodesign.ca

BELL 205, 212, 214, 412 SERIES
 QUICK RELEASE MOUNTING PROVISIONS
 STRUT FABRICATION

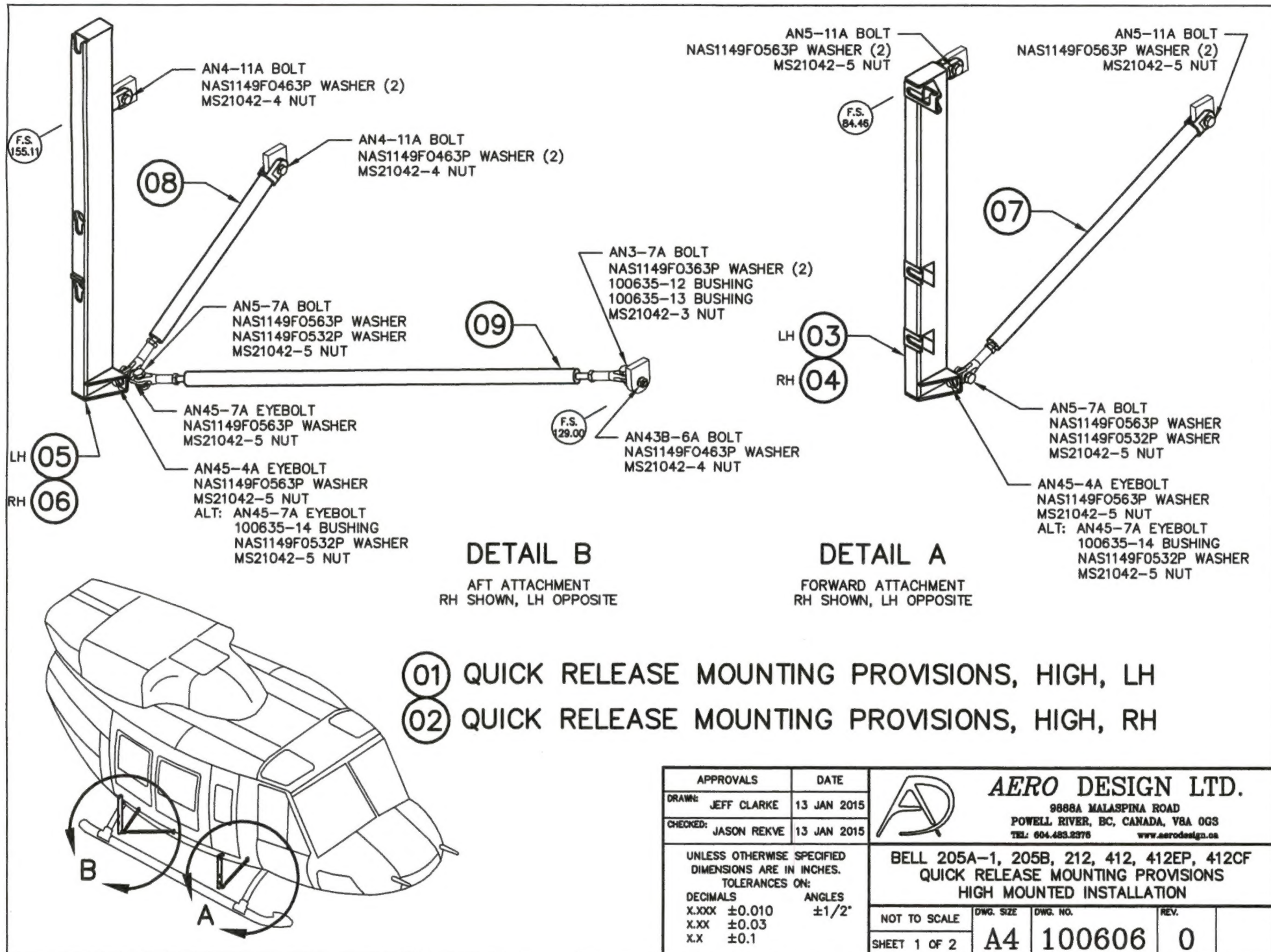
SCALE 1 : 1
 SHEET 1 OF 1

DWG. SIZE
 A1

DWG. NO.
 100635

REV.
 0

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES.
 TOLERANCES ON:
 DECIMALS ANGLES
 X.XXX ±0.010 ±1/2°
 X.XX ±0.03
 X.X ±0.1



APPROVALS		DATE		 AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.2376 www.aerodesign.ca
DRAWN:	JEFF CLARKE	13 JAN 2015		
CHECKED:	JASON REKVE	13 JAN 2015		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1				BELL 205A-1, 205B, 212, 412, 412EP, 412CF QUICK RELEASE MOUNTING PROVISIONS HIGH MOUNTED INSTALLATION
NOT TO SCALE		DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 2		A4	100606	0

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		

NOTES:

1. SEE INSTRUCTIONS FOR CONTINUED AIRWORTHINESS, ICA751.90, FOR MAINTENANCE INFORMATION.
2. INSTALLATION PROCEDURE:
 - A) INSTALL FORWARD AND AFT BEAM ON UPPER FUSELAGE HARD POINTS. DO NOT FULLY TIGHTEN BOLTS.
 - B) INSTALL FORWARD AND AFT STRUTS FROM BEAM TO LOWER FUSELAGE HARD POINTS. DO NOT TIGHTEN BOLTS.
 - C) ALIGN FORWARD AND AFT BEAMS TO BE PARALLEL WHEN VIEWED FROM THE FRONT OR BACK. THREAD CLEVIS ON STRUTS IN OR OUT TO ADJUST.
 - D) INSTALL DRAG LINK FROM AFT BEAM TO LOWER FUSELAGE HARD POINT AT FS. 129.00. THREAD CLEVIS ON BOTH ENDS IN OR OUT TO ADJUST.
 - E) ADJUST DRAG LINK FOR CENTRE TO CENTRE SPACING OF BEAMS TO 71.0 INCHES (1803 mm).
 - F) TIGHTEN ALL FASTENERS AND CHECK NUTS PER NOTE 3.
3. TORQUE FASTENERS AS FOLLOWS:
 - A) AN3 BOLTS: 12-15 IN-LBS (1.36-1.69 N-m)
 - B) AN4 BOLTS: 30-40 IN-LBS (3.39-4.52 N-m)
 - C) AN5 BOLTS, AN316-5 CHECK NUTS: 60-85 IN-LBS (6.78-9.60 N-m)
 - D) AN43 EYE BOLT: 50-70 IN-LBS (5.65-7.91 N-m)
 - E) AN45 EYE BOLTS: 100-140 IN-LBS (11.30-15.82 N-m)

1	1	MS21042-3	NUT (ALT: MS21042L3, MS21044N3)
3	3	MS21042-4	NUT (ALT: MS21042L4, MS21044N4)
7	7	MS21042-5	NUT (ALT: MS21042L5, MS21044N5)
2	2	NAS1149FO363P	WASHER
5	5	NAS1149FO463P	WASHER
2	2	NAS1149FO532P	WASHER
9	9	NAS1149FO563P	WASHER
1	1	AN3-7A	BOLT
1	1	AN43B-6A	EYE BOLT
2	2	AN4-11A	BOLT
1	1	AN45-7A	EYE BOLT
2	2	AN45-4A	EYE BOLT (ALT: AN45-7A WITH 100635-14 BUSHING)
2	2	AN5-7A	BOLT
2	2	AN5-11A	BOLT
1	1	100635-13	BUSHING
1	1	100635-12	BUSHING
1	1	100635-03	09 DRAG LINK
1	1	100635-02	08 AFT STRUT
1	1	100635-01	07 FORWARD STRUT
1		100633-01-02	06 AFT BEAM, HIGH MOUNTED, RH
	1	100633-01-01	05 AFT BEAM, HIGH MOUNTED, LH
1		100632-01-02	04 FORWARD BEAM, HIGH MOUNTED, RH
	1	100632-01-01	03 FORWARD BEAM, HIGH MOUNTED, LH
		100606-01-02	02 QUICK RELEASE MOUNTING PROVISIONS, HIGH, RH
		100606-01-01	01 QUICK RELEASE MOUNTING PROVISIONS, HIGH, LH
02	01	PART NO.	ITEM DESCRIPTION
QTY	QTY	LIST OF MATERIALS	

WEIGHT AND BALANCE - METRIC

ITEM	DESCRIPTION	WEIGHT (kg)	LONGITUDINAL		LATERAL	
			ARM (mm)	MOMENT (mm-kg)	ARM (mm)	MOMENT (mm-kg)
01	QUICK RELEASE MOUNTING PROVISIONS HIGH MOUNTED, LH	5.3	3150	16695	-1165	-6175
02	HIGH MOUNTED, RH	5.3	3150	16695	1165	6175

WEIGHT AND BALANCE - STANDARD

ITEM	DESCRIPTION	WEIGHT (LB)	LONGITUDINAL		LATERAL		
			ARM (IN)	MOMENT (LB-IN)	ARM (IN)	MOMENT (LB-IN)	
QUICK RELEASE MOUNTING PROVISIONS INSTALLATION							
01	HIGH MOUNTED, LH	11.6	124.02	1438.6	-45.88	-532.2	
02	HIGH MOUNTED, RH	11.6	124.02	1438.6	45.88	532.2	

APPROVALS	DATE
DRAWN: JEFF CLARKE	13 JAN 2015
CHECKED: JASON REKVE	13 JAN 2015



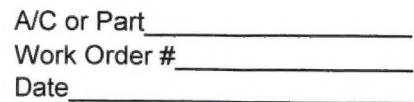
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9888A MALASPINA ROAD
POWELL RIVER, BC, CANADA, V8A 0G3
TEL: 604.463.2376 www.aerodesign.ca

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ±0.010 ±1/2"
X.XX ±0.03
X.X ±0.1

BELL 205A-1, 205B, 212, 412, 412EP, 412CF
QUICK RELEASE MOUNTING PROVISIONS
HIGH MOUNTED INSTALLATION

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 2 OF 2	A4	100606	0

Rev. Original 1 Mar 2013